We claim:

1. A steering system for a vehicle having a body supported on at least two sets of steerable wheels, comprising:

a steering shaft provided with a wheel, supported on said body;

a torque transmitting main shaft supported longitudinally on said body;

means operatively interconnecting said steering shaft and said main shaft for transmitting rotary motion of said steering shaft to rotary motion of said main shaft;

first transversely displaceable means operatively interconnecting knuckle brackets of one of said sets of steerable wheels;

means operatively interconnecting said main shaft and said first transversely displaceable means for translating rotary motion of said main shaft to linear motion of said first transversely displaceable means;

second transversely displaceable means operatively interconnecting knuckle brackets of the other of said sets of steerable wheels; and

means operatively interconnecting said main shaft and said second transversely displaceable means for translating rotary motion of said main shaft to linear motion of said second transversely displaceable means.

2. A system according to claim 1 wherein said means for transmitting rotary motion of said steering shaft to said main shaft includes a slot and cooperating key connection allowing said steering shaft to be displaced transversely relative thereto.

3. A system according to claim 1 including:

transversely disposed guide means supported on said body; and

a steering wheel assembly provided with said steering shaft supported on said guide means and displaceable therealong.

4. A system according to claim 3 wherein said steering shaft is displaceable along the axis thereof.

5. A system according to claim 3 wherein said means for transmitting rotary motion of said steering shaft to said rotary motion of said main shaft includes a slot and cooperating key connection allowing said steering shaft to be displaced transversely relative thereto.

6. A system according to claim 3 wherein said steering wheel assembly includes a base frame section supported on said guide means and a second frame section mounted on and

displaceable along a line of travel relative to said base frame section, and wherein said steering shaft is mounted on said second frame section parallel to said line of travel.

7. A system according to claim 6 wherein said means for transmitting rotary motion of said steering shaft to said rotary motion of said main shaft includes a slot and cooperating key connection allowing said steering shaft to be displaced transversely relative thereto.

8. A system according to claim 6 wherein said second frame section includes selected operator vehicle controls.

9. A system according to claim 2 including an operator's seat supported on said body, accessible to said steering wheel and displaceable transversely.

10. A system according to claim 6 including an operator's seat supported on said body, accessible to said steering.

11. A system according to claim 6 including an operator's seat supported on said body, accessible to said steering wheel and displaceable substantially vertically.

12. A system according to claim 6 including an operator's seat supported on said body, accessible to said steering wheel and disposed transversely to accommodate a driver when said steering wheel is in either a right or left hand position.

13. A system according to claim 1 wherein each of said means operatively interconnecting said main shaft and one of said transversely displaceable means for translating rotary motion of said main shaft to linear motion of said one of said transversely displaceable means includes a link pivotally connected to each of a Pittman arm and a transversely displaceable plate.

14. A system according to claim 13 wherein said link includes a pair of spaced plates having sets of opposed, registrable openings and each of said pivotal connections includes:

a portion of one of said Pittman arm and said slide plate received between said spaced plates, having an opening therethrough registrable with a set of openings in said side plates, and having an enlarged section providing an annular seat;

a first bearing seat disposed in said enlarged section, seated on said annular seat and having an opening therethrough registrable with said opening of said one of said Pittman arm and said plate, and a spherical seating surface;

a spherical bearing disposed in said enlarged section, seated on said seating surface of said first bearing seat and having a tapered opening therethrough registrable with said opening in said spherical bearing, and a spherical surface seated on said spherical bearing;

a second bearing seat disposed in said enlarged section, having an opening therethrough and a spherical surface seated on said bearing;

means provided on said one of said Pittman arm and said plate for retaining said bearing seats in said enlarged section and said bearing seated between said bearing seats; and

a tapered pin extending through said one set of openings in said side plates and spherical bearing for pivotally connecting said one of said Pittman arm and said plate with said side plates.

15. A system according to claim 14 wherein said retainer means comprises a lock nut threaded into a threaded portion of said enlarged section.

16. A system according to claim 14 including a pair of O-rings disposed between said one of said Pittman arm and said plate, and said side plates.

17. A system according to claim 14 wherein said tapered pin includes a threaded end threaded into a threaded opening in one of said side plates, and a nut formed on an opposite end thereof for applying a tool for threading said pin into position.

18. A system according to claim 1 wherein each of said transversely displaceable means is pivotally connected at each of its ends to a knuckle bracket, and each of the pivotal connections of each of said transversely displaceable means and a knuckle bracket lies in a linear line passing through the turning axis of an associated wheel and a center point of said vehicle whereby the rotational axes of the wheels are caused to intersect at a point on a line perpendicular to the longitudinal centerline of the vehicle at the center point of the vehicle, and thus result in concentric wheel tracks when the wheels are turned.

19. A system according to claim 18 wherein each of said knuckle brackets includes a surface mountable on a knuckle plate of a wheel unit of the vehicle, and a pivotal connection spaced from said mounting surface, and each of said transversely displaceable means includes a transversely displaceable plate and a pair of tie rods each pivotally connected at one end thereof to said transversely displaceable plate and pivotally connected at the other end thereof to said pivotal connection of said knuckle bracket.

20. A system according to claim 19 including spacers disposed between said knuckle brackets and their respective knuckle plates, and wherein the spacing between the pivotal

connections of said tie rods to said transversely displaceable plate is decreased an amount equivalent to the combined thicknesses of said spacers.

21. A system according to claim 20 wherein the thicknesses of said spacers decreases as the wheel base of the vehicles increases.

22. A system according to claim 1 wherein each of said means for translating rotary motion of said main shaft to one of said transversely displaceable means includes steering gear.

23. A system according to claim 1 wherein said second transversely displaceable means is spaced from and displaced 180° about a vertical axis, relative to said first transversely displaceable means.

24. A system according to claim 1 wherein each of said transversely displaceable means includes a transversely displaceable plate, a pair of tie rods each operatively interconnecting said plate and a knuckle bracket of a wheel, and each means for translating rotary motion of said main shaft to linear motion of said transversely displaceable means includes an arm member pivotal about a longitudinally disposed axis and a link interconnecting said arm member and said plate for translating pivotal motion of said arm member to linear motion of said slide plate.

25. A system according to claim 1 wherein said first transversely displaceable means operatively interconnects a front set of wheels and said second transversely displaceable means operatively connects a rear set of wheels to provide a vehicle with a 4x4 configuration.

26. A system according to claim 6 including a non-steerable set of wheels mounted on said body between said front and rear sets of wheels to provide a vehicle with a 6x6 configuration.

27. A system according to claim 1 including a third transversely displaceable means operatively interconnecting knuckle brackets of a set of steerable wheels, slaved to said first transversely displaceable means, and a fourth transversely displaceable means operatively interconnecting knuckle brackets of a set of steerable wheels, slaved to said second transversely displaceable means.

28. A system according to claim 27 wherein said means for transmitting rotary motion of said steering shaft to said main shaft includes a slot and cooperating key connection allowing said steering shaft to be displaced transversely.

29. A system according to claim 27 wherein each of said means for translating rotary motion of said main shaft to one of said transversely displaceable means includes a steering gear.

30. A system according to claim 27 wherein said second transversely displaceable means is spaced from and displaced 180° about a vertical axis, relative to said first transversely displaceable means.

31. A system according to claim 27 including means operatively interconnecting said first transversely displaceable means and the slaved means thereof for transmitting linear motion of said first transversely displaceable means to the slaved means thereof, and means operatively interconnecting said second transversely displaceable means and the slaved means thereof for transmitting linear motion of said second transversely displaceable means to the slaved means thereof.

32. A system according to claim 31 wherein each of said slaved means includes a pair of crank arms each pivotable about a longitudinal axis, means for transferring the transverse, linear motion of an operatively connected transversely displaceable means to pivotal motion of an associated pair of said crank arms, and a pair of the rods each operatively interconnecting one of said crank arms and a knuckle bracket of a wheel.

33. A system according to claim 27 wherein said third and fourth transversely displaceable means are disposed between said first and second transversely displaceable means.

34. A system according to claim 27 wherein said first transversely displaceable means operatively interconnects a front set of wheels, said second transversely displaceable means operatively interconnects a rear set of wheels, said means slaved to said first transversely displaceable means operatively interconnects a third set of wheels and said means slaved to said second transversely displaceable means operatively interconnects a fourth set of wheels to provide a vehicle with an 8x8 configuration.

35. A system according to claim 34 wherein each of the forwardmost and rearwardmost of said transversely displaceable means is pivotally connected at each of its ends to a knuckle bracket, and each of the pivotal connections of each of said forwardmost and rearwardmost transversely displaceable means and a knuckle bracket lies in a linear line passing through the steering axis of a wheel and a center point of said vehicle whereby upon turing said wheels the rotational axes of the wheels are caused to intersect at a point on a line perpendicular to the longitudinal centerline of the vehicle at the center point of the vehicle.

36. A system according to claim 34 including a nonsteerable set of wheels mounted on said body between said sets of wheels of said slaved means to provide a vehicle with a 10x10 configuration.

37. A system according to claim 36 wherein each of the forwardmost and rearwardmost of said transversely displaceable means is pivotally connected at each of its ends to a knuckle bracket, and each of the pivotal connections of each of said forwardmost and rearwardmost transversely displaceable means and a knuckle bracket lies in a line passing through the steering axis of a wheel and a center point of said vehicle whereby upon turning of said wheel the rotational axes of the wheels are caused to intersect at a point on a line perpendicular to the longitudinal centerline of the vehicle at the center point of the vehicle.

38. A steering unit for a vehicle having a body supported on a set of wheels, comprising:

transversely disposed guide means supported on said body; and

a steering wheel assembly provided with a steering shaft operatively connectable with at least one set of steerable wheels of said vehicle, supported on said guide means and displaceable therealong.

39. A unit according to claim 38 wherein said steering shaft is displaceable along the axis thereof.

40. A unit according to claim 38 including a transversely disposed torque transmitting shaft and means for transmitting rotary motion of said steering shaft to rotary motion of said transversely disposed torque transmitting shaft, and wherein said transversely disposed shaft is operatively connectable to at least one set of steerable wheels of said vehicle.

41. A unit according to claim 38 wherein said steering wheel assembly includes a base frame section supported on said guide means and a second frame section mounted on and displaceable along a line of travel relative to said base frame section, and wherein said steering shaft is mounted on said second frame section parallel to said line of travel.

42. A unit according to claim 41 wherein said second frame section includes selected operator vehicle controls.

43. A unit according to claim 38 including an operator's seat supported on said body, accessible to said steering wheel.

44. A unit according to claim 41 including an operator's seat supported on said body, accessible to said steering wheel and displaceable substantially vertically.

45. A unit according to claim 41 including an operator's seat supported on said body, accessible to said steering wheel and disposed transversely to accommodate a driver when said steering which is in either a right or left hand position.

46. A linkage suitable for transmitting forces with minimal lash comprising:

first and second spaced members having aligned openings;

a third member having a portion received between said spaced members, said portion having an opening therethrough aligned with said openings of said spaced members and said opening having an enlarged section providing an annular seat;

a first bearing seat disposed in said enlarged section of the opening in said third member, seated on said annular seat and having an opening therethrough aligned with the openings of said spaced members, and a spherical seating surface;

a spherical bearing disposed in said enlarged section, seated on said seating surface of said first bearing seat, and having a tapered opening therethrough aligned with the openings in said spaced members;

a second bearing seat disposed in said enlarged section, having an opening therethrough aligned with said opening in said spherical bearing, and a spherical surface seated on said spherical bearing;

means provided on said third member for retaining said bearing seats in said enlarged section and said spherical bearing seated between said bearing seats; and

a tapered pin extending through said aligned openings in said spaced members and spherical bearing for pivotally connecting said third member to said first and second spaced members.

47. A linkage according to claim 46 wherein said retaining means comprises a lock nut threaded into a threaded portion of said enlarged section.

48. A linkage according to claim 46 including a pair of O-rings each disposed between one of said spaced members and said third members.

49. A linkage according to claim 46 wherein said tapered pin includes a threaded end threaded into a threaded opening in one of said spaced plates, and a nut formed on an opposite end thereof for applying a tool for threading said pin in position.

50. A linkage according to claim 46 wherein said members comprise a portion of a steering system operable to translate pivotal motion to linear motion.

51. A system according to claim 32 wherein a suitable dimension of the radial distance of the axis of the pivotal connection of each of said crank arms with its respective tie rod, relative to said longitudinal pivot axis of said crank arm, is selected to provide turning angles of the wheels of said slaved means whereby upon the turning of said wheels the rotational axes of said wheels will intersect at a point common to the intersections of the axes of the other wheels of said vehicle.

52. A system according to claim 32 including means pivotally connected to each of said crank arms for transmitting translated linear motion of said first transversely displaceable means to pivotal motion of said crank arm, and wherein the axis of the pivotal connection of each crank arm with its respective tie rod is displaced relative to a linear line intersecting said longitudinal axis of said crank arm and a further axis of the pivotal connection of said crank arm and said means for transmitting linear motion of said first transversely displaceable means to said crank arm, to provide turning angles of the wheels of said slaved means whereby upon the turning of said wheels the rotational axes of said wheels will intersect at a point common to the intersections of the axes of the other wheels of said vehicle.